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| **题目** | **H公司软件开发过程的改进研究** |

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| **作者** | **刘江** |

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| **专业领域** | **工程管理硕士** |
| **指导教师** | **钱艳俊** |
| **培养单位** | **管理学院** |
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指导教师： 钱艳俊

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**By**

Liu Jiang

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Qian Yanjun

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学位论文评阅人和答辩委员会名单

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# 摘 要

随着计算机科学技术的普及和兴起，信息化水平越来越高，市场上软件产品更新速度加快，导致软件开发的模式面临巨大挑战。软件开发的过程管理贯穿于软件全生命周期的各个阶段，因此软件开发的过程管理是保证软件顺利上线的重要环节。但是目前传统的软件开发模式只关注技术实现，软件的设计及开发比较粗放，且市场导向性不足，缺乏高效的过程管理运作机制，导致软件开发周期长，效率低等问题。随着软件市场竞争的加剧，如何建立高效的软件开发过程体系，以提升开发效率和实施效果，开发出符合市场需求的高质量软件，是目前大部分企业都在思考的问题之一。

软件开发的过程管理是提升软件开发效率和软件质量的一个重要手段。目前企业在软件开发过程中，都存在一系列的问题，比如需求蔓延、无法按照原定工期完成、资源不足等，导致软件的交付周期和质量严重受到影响，进而影响客户的满意度。为了快速响应市场需求的变化节奏，企业迫切需要提高软件开发过程管理能力，构建完善且高效的过程管理方法，用以规范软件开发各个环节过程。以结果为导向，建立完备的软件过程管理方法论，实现端到端的软件过程控制与平衡，提高开发效能，缩短开发周期，减少软件开发中不必要的成本溢出，保证软件高质量交付上线。

本文的研究目的，是以H公司的数据分析设备系统软件开发项目作为对象，引入项目管理的概念，运用进度管理和质量管理的理论，通过CMMI模型评估分析公司软件开发过程管理存在的问题，再对存在问题进行优化，得到了过程改进后的效果，为国内软件企业选择CMMI模型进行软件开发过程管理提供了参考案例。本文将理论与实际相结合，注重实践效果，首先系统地介绍了软件项目过程管理理论，运用成熟度模型方法进行过程改进，探讨了CMMI成熟度模型在企业软件开发管理和改进过程中的重要指导作用和突出的效果，并通过对H公司目前软件开发现状描述和过程管理要点分析，发现了公司在软件开发管理上存在的一系列问题。在通过对CMMI关键过程域的裁剪后，提出一套适合自身的软件过程管理标准流程，使得项目团队能够更详细地度量软件开发的过程及控制开发进度、把控产品质量，进一步地提升了企业软件开发的能力。虽然本文研究构建的软件过程管理的框架模型具有很强的针对性，但因其理论来源于真实的实践案例，而又不同于传统企业实践，因此对于我国软件公司在过程管理改进案例研究有着很重要的实际意义。

关键词：软件开发；过程改进；CMMI；DevOps；

# **Abstract**

With the popularization and rise of computer science and technology, the level of informatization has been increasing, resulting in accelerated updates of software products in the market. This situation has posed significant challenges to the traditional software development models. Process management in software development is essential throughout the various stages of the software lifecycle, making it a crucial aspect in ensuring the successful deployment of software. However, the current traditional software development models mainly focus on technical implementation, resulting in inefficient and loosely designed software development processes, lack of market orientation, and ineffective process management mechanisms. Consequently, issues such as long development cycles and low efficiency have emerged. With intensified competition in the software market, how to establish an efficient software development process system to improve development efficiency and implementation effectiveness, and to develop high-quality software that meets market demands, has become a major concern for many enterprises.

Process management in software development is an important means to enhance development efficiency and software quality. Currently, enterprises face a series of problems in their software development processes, including requirements creep, failure to meet scheduled deadlines, and resource shortages. These issues seriously affect the delivery cycle and quality of software, consequently impacting customer satisfaction. In order to rapidly adapt to the changing pace of market demands, enterprises urgently need to improve their software development process management capabilities and establish comprehensive and efficient process management methods to standardize the various stages of software development. By adopting a results-oriented approach and establishing a comprehensive software process management methodology, end-to-end software process control and balance can be achieved, leading to improved development efficiency, shortened development cycles, reduced unnecessary cost overruns in software development, and ensuring the high-quality delivery of software.

The purpose of this paper is to use H Company's data analysis equipment system software development project as a case study. It introduces the concept of project management, applies the theories of schedule management and quality management, evaluates the problems in the company's software development process management using the CMMI model, and optimizes the identified issues. The results of process improvement are obtained, providing a reference case for domestic software enterprises choosing the CMMI model for software development process management. This paper combines theory with practice, emphasizing practical results. Firstly, it systematically introduces the theory of software project process management and applies maturity model methods for process improvement. It discusses the important guiding role and outstanding effects of the CMMI maturity model in enterprise software development management and improvement processes. By describing the current software development status and analyzing process management key points in H Company, a series of problems in software development management are identified. After tailoring the critical process areas of CMMI, a set of standardized software process management procedures suitable for the company is proposed, enabling project teams to measure the software development process in more detail, control development progress, and ensure product quality. This further enhances the company's software development capabilities. Although the framework model of software process management constructed in this paper is highly targeted, it is derived from real practical cases and differs from traditional enterprise practices. Therefore, it has significant practical significance for case studies on process management improvement in software companies in China.

**Key words:** Software Development; Process Improving; CIIM; DevOps

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# 附 录

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